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GENERAL STUDIES (TEST CODE : 755)

Name of Candidate	ARUSHI MISHRA		
Medium Hindi/Eng.	ENGLISH	Registration Number	15577
Center	ORN	Date	2/11/2016.

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	12.5	
2	12.5	
3	12.5	
4	12.5	
5	12.5	
6	12.5	
7	12.5	
8	12.5	
9	12.5	
10	12.5	
11	12.5	
12	12.5	
13	12.5	
14	12.5	
15	12.5	
16	12.5	
17	12.5	
18	12.5	
19	12.5	
20	12.5	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are TWENTY questions printed in HINDI and ENGLISH.
   इसमें बीस प्रश्न हैं तथा हिन्दी और अंग्रेजी दोनों में छपे हैं।
3. All questions are compulsory.
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

EVALUATION INDICATORS

1. Alignment Competence
2. Context Competence
3. Content Competence
4. Language Competence
5. Introduction Competence
6. Structure - Presentation Competence
7. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

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Answer all the questions in NOT MORE THAN 200 WORDS each. Content of the answers is more important than its length. All questions carry equal marks.

12.5X20=250

1. Explain the reasons for low organ donation in India. How can the Green Corridor concept smoothen the process of organ transplantation in India?

भारत में कम संख्या में अंग-दान के कारणों की व्याख्या कीजिए। हरित गलियारे (ग्रीन कॉरिडोर) की संकल्पना किस प्रकार भारत में अंग-प्रत्यारोपण की प्रक्रिया को सरल बना सकती है?

Organ donation still has not picked up in India despite the increased awareness.

The reasons for low organ donation are :-

i) Less awareness among people
ii) Less Emotions and social stigma attached
iii) Government regulation on non-related organ donation due to organ racket
iv) Less presence of proper channels for donation
v) Lack of transport and coordination

Due to this, organ donation which can save millions of lives each year has not picked up. Some states like Tamil Nadu has come up with an option of organ donation on accidental death in the driving licence itself. This provides a channel for authorised and willing organ donations.

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The Green corridor concept as envisaged proposes to build and designate roads for easy and fast transport of organs across the cities for transplant. Often the victims of road accident lie on road without proper medical aid and organ removal in case of death. This not only diminishes the life prospects of the victim but also the recieves.

It also envisages helicopter service for quick pickup of organs and hence this could go a long way in organ harvesting. An organ harvested from going waste can save a life.

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2. Highlight the features of NAVIC and bring out its significance for India. How is it different from GAGAN? Examine whether NAVIC can be a replacement of GPS for India.

नाविक (NAVIC) की विशेषताओं पर प्रकाश डालिए तथा भारत के लिए इसके महत्व को उजागर कीजिए। यह गगन (GAGAN) से किस प्रकार भिन्न है? परीक्षण कीजिए कि क्या नाविक भारत के लिए जी.पी.एस. को प्रतिस्थापित कर सकता है।

NAVIC stands for Navigation with Indian Constellation. A fleet of seven satellites, NAVIC is one of the most remarkable achievements of ISRO. It has the following features :-

i) Four geosynchronous and three geostationary satellites

ii) Providing 'Special Positioning services' for civilian use and 'Restricted services' for military uses

iii) Covers Indian mainland and additional 1500 km area around it

iv) Imaging with precision of 10m on ground and 20m on water bodies.

v) Provides navigation as well as remote sensing.

vi) A frugal and yet remarkable engineering of only 1420 crores.

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It is significant for India as it provides precise navigation system. Its 'Restricted Service' ensures national security in case the U.S. based GPS switches off its services for India. A self reliable network also would prevent crucial data theft.

GAGAN services were for small area and for specific users, whereas NAVIC provides a pan India service for every individual.

NAVIC can be a replacement of GPS in India within a few years. Currently, it has to rely on GPS as NAVIC is only a regional navigation system. But once it expands further, it can replace GPS with a self sufficient, secure and a more precise navigation system than GPS.

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3. Explain the concept of Internet of Things (IoT) with examples. How can IoT play a role in the transformation of India into a digital economy?

इंटरनेट ऑफ थिंग्स (आई.ओ.टी.) संकल्पना की उदाहरण सहित व्याख्या कीजिए। भारत को एक डिजिटल अर्थव्यवस्था में रूपांतरित करने में आई.ओ.टी. किस प्रकार अपनी भूमिका अदा कर सकता है?

Internet of Things (IoT) evolved as a concept of linking the physical world to the software systems. It implies the use of internet in digitising any aspect of life.

The recent launch of 'Industrial Internet' in 2016 ~~like~~ linking transport, manufacturing and other industrial activities with internet gives example of the concept of IoT being applied in industrial segment

With the world connecting to internet, IoT emerges as a new form of cooperation and utility. It can play various roles of transforming India into a digital economy as:-

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i) Automatisation of hazardous and recurring work

ii) Connecting rural hinterland with cloud computing, telemedicine, teleeducation, etc

iii) Automatic cars, automatic rail / road network can enhance road safety.

iv) Digitally linked smart cities to improve life standard.

v) Digital linking of India's hinterland to the world class facilities

eg: GIAN educational network.

Hence, India by taking terrestrial internet to satellite based internet can cause cheap and quick linking of the physical world to the digital revolution. It is the next new thing which makes work easier, faster and cheaper.

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4. What are Carbon Nanotubes (CNTs) and how are they an improvement over carbon fibres? Highlight the various unique properties of CNTs which makes them suitable to the manufacturing industry.

कार्बन नैनोट्यूब (सी.एन.टी.) क्या होते हैं तथा वे किस प्रकार कार्बन फाइबर से श्रेष्ठ हैं। सी.एन.टी. के उन विशिष्ट गुणधर्मों पर प्रकाश डालिए जो इसे विनिर्माण उद्योग हेतु उपयुक्त बनाते हैं।

Carbon Nanotubes

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5. Explain the significance of gravitational waves recently detected by LIGO. What are the objectives of the recently envisaged LIGO-India project and what benefits will India accrue from it?

हाल ही में एल.आई.जी.ओ. (लिगो) द्वारा खोजे गए गुरुत्वीय तरंगों के महत्व की व्याख्या कीजिए। हाल ही में परिकल्पित एल.आई.जी.ओ.-इंडिया प्रोजेक्ट (लिगो-भारत परियोजना) के क्या उद्देश्य हैं, तथा भारत को इससे क्या लाभ होंगे?

The recent detection by the U.S.A. based LIGO observatory of the Gravitational Waves holds a possibility of new things as:-

i) studying outer space through Gravitational waves
ii) Understand formation of the Universe
iii) Listen to space sounds
iv) Frequency measurement of catallysmic events
v) Study merger of ~~dark~~ black holes, supernovae, etc

This is a very significant discovery that will change the universe studies forever. India was a part of the LIGO detector and hence Government has commissioned LIGO-India project.

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The LIGO-India observatory is to be made perpendicular to the US ~~Ligo~~ US-LIGO and work in unison to detect further Gravitational waves by celestial phenomenon. It promotes Indian scientists for new avenues of knowledge through collaboration with the U.S.A.

India would advance in the scientific research that holds the key to further studies. It would promote scientific temper and absorption of new technologies. By standing shoulder to shoulder with the developed world, India stands ahead of many countries in technological advancements which holds the key to a significant booster to economy through applicational research.

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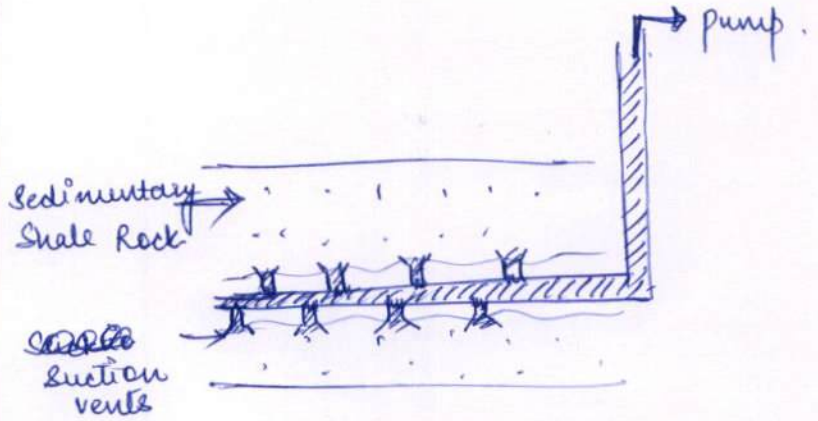
6. Fracking is key to shale gas extraction. Explain. Enumerate the steps taken by India in recent times for shale development. Also discuss the challenges that India faces in shale gas extraction.

फ्रैकिंग, शेल गैस निष्कर्षण की कुंजी है। व्याख्या कीजिए। हाल के दिनों में भारत द्वारा शेल गैस के विकास के लिए उठाए गए कदमों का वर्णन कीजिए। इसके अतिरिक्त शेल गैस निष्कर्षण में भारत के समक्ष विद्यमान चुनौतियों की चर्चा कीजिए।

Shale Gas remains deep under the rock bed covered by methane. It lies in the sedimentary rocks - shale and hence as such no trapped resource is there. Therefore, fracking as a concept comes that injects high pressure water in the underbed pores and then sucks the shale gas by appying pressure.



FRACKING.

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fracking as has to be done deep inside the Earth with a lot of pressure needs expertise and is costly. Therefore only a few countries like USA, India have succeeded in this.

Recently, Government of India has introduced NELP - New Exploration Licence Policy that promotes Shale Gas Extration. Further, subsidies and tax benefits have been given.

India faces the following challenges:-

i) Too much capital required
ii) Have less efficient technology
iii) Uncertainity of reserves therefore less private sector interest
iv) Indian shale reserves found in deep sea hence needs further expertise.

∴ However, the promotion by the

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Government is promoting the discoveries in the Krishna Godavari basin and Kutch are of India.

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7. In recent years India is said to be facing a health epidemic with the rise in number of diabetics. Explain the reasons for prevalence of such a high number of diabetics in India. In which areas should efforts be directed to control this problem?

हाल के वर्षों में मधुमेह के रोगियों की संख्या में वृद्धि के कारण कहा जा रहा है कि भारत स्वास्थ्य संबंधी एक महामारी का सामना कर रहा है। इतनी अधिक संख्या में भारत में मधुमेह रोगियों की उपस्थिति के कारणों की व्याख्या कीजिए। इस समस्या को नियंत्रित करने हेतु किस दिशा में प्रयास किए जाने चाहिए?

India is overburdened due to the increase in diabetes especially Type II - Diabetes Mellitus. The recent WHO reports India to be in the top 5 countries of people having diabetes.

Reasons for prevalence are :-

i) Unhealthy lifestyle of over sugar consumption
ii) Sedentary lifestyles on rise
iii) Packaged foods' intrusive consumption
iv) Inefficient Government intervention

This has led to India overburdened under the heath epidemic of diabetes.

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Areas where diabetes control efforts can be directed could be :-

i) Packaged food industry

- to mandatorily mention sugar content in bold

ii) Awareness

- campaign on lines of antibiotics - red line campaign
- roping NGOs and panchayats
- promote active lifestyles

iii) Government

- provision of effective medicines
- regular health checkups
- imposition of taxes on the lines of Kerala Government : the Obesity Tax.

~~The fight for world de~~

The fight against diabetics is going on worldwide with many U.S. states' imposing Sugar Tax to decrease consumption of people and pave way for a healthy society.

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8. Explain in brief the three staged nuclear program of India. What are the advantages of thorium over other nuclear fuels? Examine the hurdles in the way of large-scale deployment of thorium-fuelled reactors in India.

संक्षेप में भारत के तीन चरणों वाले नाभिकीय कार्यक्रम की व्याख्या कीजिए। थोरियम अन्य नाभिकीय ईंधनों से किस मायने में बेहतर है? भारत में वृहद् पैमाने पर थोरियम-ईंधन आधारित रिएक्टरों को स्थापित करने के मार्ग में उपस्थित चुनौतियों का परीक्षण कीजिए।

The three staged nuclear fuel program was envisaged by Homi J. Bhabha in 1964.

- The first stage – use of uranium based fuels
- The second stage – use of recycled uranium with plutonium as fuels in Pressurised Heavy water Reactors
- The third stage – use of thorium as fuel in Pressurised fast Breeder Reactors

Every stage of the reactor was meant to improve efficiency and self sustainability of the nuclear program of India.

Thorium as a fuel has certain advantages of other nuclear fuels as :-

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i) It is locally found in India - Kerala's Monazite sand

ii) Needs less energy and gives higher efficiency

iii) Has less time for radioactive decay so radioactive wastes can be disposed off quickly.

iv) It is reusable to large extent.

However, India is facing hurdles in large-scale deployment of thorium based reactors due to two reasons :-

i) Need very efficient technology

ii) No precedent of thorium use worldwide.

Hence these problems if overcome would lead to an energy secure nation ready on the path of development.

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9. What do you understand by Net Neutrality? Analyze the perspectives of various stakeholders on the issue. What do TRAI's 2016 regulations mean for net neutrality?

नेट तटस्थता (न्यूट्रलिटी) मे आप क्या समझते हैं? इस मुद्दे पर विभिन्न हितधारकों के दृष्टिकोणों का विश्लेषण कीजिए। नेट तटस्थता के संदर्भ में ट्राई (टी.आर.ए.आइ.) के 2016 के विनियम क्या अर्थ रखते हैं?

Net neutrality means an open platform for equal use opportunity for everyone. The recent furore over launch of Free Basics and subsequently TRAI's consultation paper brought the light to the concept of Net neutrality which has been a pillar of internet freedom since its inception.

Facebook argue for a special access for some sites without a data plan would enhance internet connectivity.

However others argue that creating a special way to reach certain websites would erode the concept of net neutrality. It would lead to Facebook control the content flow. It

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can also leave the small startups, students, investors from accessing the customers via internet as they would have to pay money for access through Free Basics. This nullifies the basic concept of freedom ~~by~~ of advertising space offered by internet.

In this backdrop the consultation paper of TRAI on differential pricing was circulated that formed the basis of TRAI's 2016 regulation which bans Free Basics as it violates net neutrality by cartelisation of the vibrant platform provided by Internet. Hence, ~~by~~ upholding of Net Neutrality Internet would remain free and equal for all.

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10. What are the criteria employed for a pandemic to be declared a Public Health Emergency of International Concern (PHEIC) by the WHO? In the wake of recent Ebola and Zika virus outbreaks examine the efficacy of the prevalent architecture of global health governance. Also, assess India's preparedness in handling such global epidemics.

डब्ल्यू.एच.ओ. द्वारा किसी महामारी को पब्लिक हेल्थ इमरजेंसी ऑफ़ इंटरनेशनल कंसर्न (PHEIC) के रूप में घोषित करने के लिए क्या मानदंड अपनाए जाते हैं? हाल ही में इबोला तथा ज़ीका विषाणु के प्रसार के सन्दर्भ में वैश्विक स्वास्थ्य प्रबंधन की प्रभावोत्पादकता की जाँच कीजिए। ऐसी वैश्विक महामारियों से निपटने के लिए भारत की तैयारियों का मूल्यांकन कीजिए।

For declaring a Public Health Emergency of International Concern, ~~the~~ ~~not~~ as a pandemic, WHO has to access if the disease has spread very quickly to one or more continents/countries and is not taming down by Governmental efforts.

~~So~~ The Ebola attack in West Africa ~~saw~~ saw a delayed response of WHO in declaring in a PHEIC which delayed international efforts and funding causing loss of lives.

Learning from this, Zika virus attack in the Latin American countries quickly got concern, medical aid and funding from WHO.

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The Global Health Governance though good but is not robust when it comes to underdeveloped countries. Lack of power delays attention to aid and development of medicines. However, with developed countries it is working very quickly. Nevertheless, it has created a platform for medical advice, aid and funds that has helped strengthening health structures world over.

India has a strong security check measures and robust lessons like ending Polio epidemic, however due to widespread poverty and illiteracy there is a fear of any disease engulfing thousands. India needs following things to increase preparedness :-

i) strengthen ~~publi~~ primary health centers
ii) spend in research of medicines
iii) Enhance medical checkups.
iv) Promote sanitation drive

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India is not efficiently equipped to deal with such epidemics and need a complete overhaul for enhanced safety.

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11. How is the recently launched Unified Payments Interface (UPI) system different from the prevailing funds transfer systems? Discuss its potential to change the payments landscape in India, with special reference to financial inclusion.

हाल ही में आरम्भ की गयी एकीकृत भुगतान इंटरफेस (यू.पी.आइ.) प्रणाली वर्तमान निधि अंतरण प्रणालियों से किस प्रकार भिन्न है? वित्तीय समावेशन के विशेष सन्दर्भ में इस प्रणाली द्वारा भारत में भुगतान परिदृश्य को बदल सकने की संभावना पर चर्चा कीजिए।

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12. Discuss the key challenges associated with global internet governance? What is India's stand with respect to it?

वैश्विक इंटरनेट गवर्नेंस के साथ संबद्ध मुख्य चुनौतियों पर चर्चा कीजिए। इस संबंध में भारत का क्या रुख है?

The shifting of ICANN from U.S. controlled model to a multistakeholder model is a major change in the internet governance.

Global internet governance is faced with challenges like hegemony of U.S. and net-neutrality.

Internet evolved from the USA as a free platform. It was governed by its laws then. Now a multistakeholder model though provides hope but still has challenges like:-

i) Judicial control on ICANN rests with U.S.A.

ii) Governed by U.S.'s laws

iii) Multistakeholders are countries and big industrialists mainly from U.S.A.

iv) Even IANA – a body that provides regional I.P. addresses is under U.S.' laws.

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These issues make internet under control of U.S.A. which can clamp down anything when desired. Multistakeholder model has loosened the control but more needs to be done.

~~India has accepted the~~

India has welcomed the new model but wants a more representative form of stakeholding by every country. It prefers bringing internet under an independent global authority like International Telecommunications union for fair global internet governance.

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13. Whereas various policy measures over the years have put emphasis on innovation yet India lags behind globally on the innovation indices. Examining the factors contributing to such a scenario, identify the steps taken in recent years to address the issue.

पिछले वर्षों में विविध नीतिगत उपायों ने नवोन्मेष पर बल दिया है, फिर भी भारत नवोन्मेष सूचकांक में वैश्विक रूप से पीछे है। इस परिदृश्य के लिए उत्तरदायी कारकों का परीक्षण करते हुए, इस मुद्दे के समाधान के लिए हाल ही में उठाए गए कदमों की पहचान कीजिए।

India scores low when it comes to innovation. ~~It is due to the~~ Despite many interventions India still lags globally due to the following reasons :-

i) Culture of favouring job not innovative ideas
ii) ~~Low~~ Less funding to research and education
iii) Not promoting research
iv) Lack of favourable structure to lead to professionalising the innovation

India lags in innovation which has become a hurdle of it becoming a manufacturing superpower despite being a knowledge hub. India being a capital of frugal engineering

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needs better environment to innovate. Some recent steps by the Government to address this issue are :-

i) Launch of Atal Innovation Mission
ii) MANAK awards – professionalising GO ideas
iii) Incubation Centers formation
iv) Easy IPR process
v) Promotion of start-ups
vi) Increasing awareness and interest.

By easing the process by removing the roadblocks, India aims to become a cost effective innovation hub.

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14. Give a brief explanation of CRISPR - gene editing technology. Also discuss its significance in modern biology and agriculture.

जीन एडिटिंग प्रौद्योगिकी - सी.आर.आई.एस.पी.आर. (CRISPR) की संक्षिप्त व्याख्या प्रस्तुत कीजिए। आधुनिक जीव-विज्ञान तथा कृषि में इसके महत्व पर भी चर्चा कीजिए।

CRISPR – gene editing technology is the new technology of targeted mutation that uses DNA- RNA base pairing to change the genetic sequence.

In this the RNA guides the CRISPR enzyme to cut the DNA and insert the required sequence. It is a cost effective and precise technology. It has the potential to insert, delete, change the genetic sequence for the benefit of humanity.

In modern biology, this gene editing technique can cause revolution as it can be used in :-

i) genetically healthy babies
ii) Elimination of diseases from human line.
iii) Can eliminate virus, bacteria by making them sterile eg. Mosquitos

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In agriculture, it can lead to healthier plants with more output and pest resistance. It can help reduce food shortage in future. It can help in bio fortification of crops for nutritional security.

However with great potentials comes great concerns as the effect of this technology ~~on~~ the ecosystem is not known and can also ~~cto~~ lead to many ethical issues of designer babies, etc. Hence, caution needs to be given for the technology to be used for constructive negotiation with the nature.

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15. What do you understand by Big-data? Using SDGs as an example, discuss its role in effective implementation of public policy. Also mention challenges faced in using Big-Data and measures to overcome them.

बिग-डेटा से आप क्या समझते हैं? एस.डी.जी. को एक उदाहरण के रूप में प्रस्तुत करते हुए सार्वजनिक नीतियों के प्रभावी कार्यान्वयन में इसके महत्व पर चर्चा कीजिए। इसके अतिरिक्त, बिग-डेटा के प्रयोग में आने वाली चुनौतियों तथा उनके समाधान के उपायों पर भी चर्चा कीजिए।

Big data is the enormous amount of data created by digitisation. It is characterised by 3Vs :-

i) Variety
ii) Volume
iii) Velocity

More than 90% of the data has been created within two years. The enormity of this huge amount of data presents opportunities and challenges.

In the area of effective implementation of public policy such as SDG goals, Big Data can:-

i) Professionalise results by decreasing faults
ii) Combining database and applying filter to identify beneficiary.

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iii) Develop drugs by data churning
iv) Help in problem area identification by analyzing
v) link database for real time fast delivery.

Challenges faced by the big data is that current systems are trying to cope up with too much data, finding difficult to analyse. Huge volume of data generation is making Big analytics come to fore. Unless efficiently controlled it can crash our systems.

Some measures can be taken to overcome the issue as:-

i) upgrading computer systems
ii) Cloud computing
iii) Promoting big data analytics
iv) Training of professionals.

With the 'Big Data' as the new thing, India needs to strengthen its capability to churn and analyse Bigdata to fulfill its dream of Digital India.

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16. In context of space technology, what is a Reusable Launch Vehicle? Examine the rationale behind its development. Discuss the technological and economic challenges that RLV development faces in India.

अंतरिक्ष प्रौद्योगिकी के सन्दर्भ में, पुनर्प्रयोज्य प्रक्षेपण यान (रियूजेबल लॉन्च व्हीकल-आर.एल.वी.) से आपका आशय क्या है? इसके विकास के पीछे अन्तर्निहित उद्देश्य का परीक्षण कीजिए। भारत में, आर.एल.वी. के विकास के समक्ष आने वाली प्रौद्योगिकीय तथा आर्थिक चुनौतियों पर चर्चा कीजिए।

Reusable Launch Vehicle is a proposed launch vehicle and rocket developed to launch missions/ satellites and then be reused again. It is a form of Two Set to Orbit plan.

It was recently tested in India as a technology demonstration mission. It is developed for the following reasons:-

i) Decrease cost due to reuse
ii) Reduction in space debris
iii) Uses SCRAMJET engine which uses oxygen from outside making it faster and lighter
iv) To make launching easy and cost effective thereby turning a global service provider.

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RLV testing and development need a lot of technological expertise and money which would lead to its final development by 2030.

RLV to develop needs to: ~~develop~~

i) Reentry technology.
ii) Ability to withstand heat during reentry
iii) Develop SCRAMJET engine
iv) Need landing technology
v) Need to build hypersonic speed capability.

All these technological challenges would take time to develop, a project that is scrined by India when it was abandoned by the world.

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17. Discuss the grounds on which introduction of genetically modified crops are resisted in India. Can focus on traditional farming practices provide an alternative to GM crops in dealing with the problem of food shortage?

भारत में आनुवंशिक रूप से संशोधित फसलों की कृषि को प्रारम्भ का जिन आधारों पर प्रतिरोध किया जाता है, उनकी चर्चा कीजिए। क्या खाद्य की कमी की समस्या के समाधान हेतु पारंपरिक कृषि प्रथाओं पर बल देना, जी.एम. फसलों का एक विकल्प हो सकता हैं?

Genetically modified crops are being resisted in India as seen from blocking the introduction of DMH-11 Mustard despite field trials being completed.

Genetically modified crops are being resisted due to our bitter experience with Monsanto funnelling the seeds. The dependency that can be caused is resisted as:-

i) Do not know its effects on ecology
ii) Can cause imbalance among farmers who hold and do not hold the seeds.
iii) Their safety still not known.
iv) Can lead to seed monopolization

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India is already a 4th country in the world with area under cultivation of genetically modified seeds – of cotton only. World is moving towards genetically modified crops with USA and China leading it.

The effect of climate change causing ~~failing~~ droughts, increased pest ~~resis~~ attacks, failing monsoons, huge population provides a case for revolutionary technology to address food shortage in future.

With pressure on land increasing as seen by farmer's suicide and GEAC, the apex body of India for genetic research taking considerable precautions, India can move to Genetically modified crops in a controlled manner. The shift of people from agriculture needs high yielding varieties to feed large population from less hands which is less possible in traditional farming practices.

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18. Even though large infrastructure projects like High Speed Rail (HSR) facilitate greater technological development, they come with their own set of challenges. Examine in the context of proposed HSR projects in India. Suggest some measures on how HSR can truly be 'Made in India'.

यद्यपि हाई स्पीड रेल (एच.एस.आर.) जैसी बड़ी अवसंरचना परियोजनाएं व्यापक स्तर पर प्रौद्योगिकीय विकास में सहायता करती हैं, लेकिन उनकी भी अपनी चुनौतियां होती हैं। भारत में प्रस्तावित एच.एस.आर. परियोजनायों के परिप्रेक्ष्य में परिक्षण कीजिए। कुछ उपाए बताईये कि कैसे सही मायने में एच.एस.आर. 'मेड इन इंडिया' हो सकता है।

The proposed import of the Shinkansen High Speed Rail technology from Japan to build High speed Rail projects across major Indian corridors like Delhi - Mumbai brings new avenues of opportunities and challenges.

HSR facilitate technology transfer to India to modify its own systems. It promotes manufacturing of spare parts and rails, etc needed for them. Overall, ~~the~~ ~~high~~ technology enhances economy and life standard in general.

However, the large infrastructural projects like HSR comes with challenges like :-

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i) Large land clearance required
ii) Large scale displacement of people causing results
iii) Damage to natural ecology
iv) Very expensive to build and maintain
v) Need electricity for working thereby increasing energy demand.

Though technology is being transferred to India with proposed HSR developement projects by China and Japan, to make it truly a 'Make-in-India' project we need to encourage private sector participation first on small pilot projects and then on large scale. Inviting investors for joint venture with Indian private sector companies and not Government would make it truly Made in India.

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19. The rise of antibiotic resistant bacteria can be attributed to many factors and is a cause of global concern. Elaborate. Explain how surveillance, research and global cooperation are key in tackling this menace with special reference to India as a global pharmaceutical hub.

प्रतिजैविक-प्रतिरोधी जीवाणुओं (एंटीबायोटिक रेसिस्टेंट बैक्टीरिया) में वृद्धि के पीछे कई कारण हो सकते हैं तथा यह वैश्विक चिंता का भी विषय है। सविस्तार बताईए। एक वैश्विक औषधीय केंद्र के रूप में भारत को संदर्भित करते हुए, व्याख्या कीजिए कि किस प्रकार निगरानी, शोध तथा वैश्विक सहयोग वस्तुतः इस खतरे से निपटने हेतु आवश्यक है।

The recent finding of a colistin resistant SUPERBUG carrying MCR-1 gene in U.S.A. has caused concern. The fact ~~of~~ is that gene is found in DNA plasmid capable of spreading to more bugs and humans has caused global concerns.

The factors for rise of antibiotic resistant bacteria are:-

i) Excessive use of antibiotics
ii) Profligate prescriptions
iii) Increased used ~~for~~ for livestocks.

It is cause for global concern as antibiotic resistance is rising, effectivity of medicines decreasing and consumption rising. This is leading to a new post-antibiotic age of fatal superbugs of no cure.

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India stands at the cusp of antibiotic consumption worldover. India being a global pharmaceutical hubs manufacture drugs for the whole world which increase its susceptibility and responsibility

Enhanced surveillance is necessary as it provides the cue to overconsumption leading to clampdown. Research is needed in pharmaceutical sector to remain relevant to the world. As a pharmaceutical hub, India needs to fasttrack its research to develop cure of resistant strains.

India's 'Red Line Campaign' for stopping overconsumption of antibiotic is a positive step towards this direction. But this needs a global effort and recreation as it the globalised world, spread of strains is possible easily. Therefore a global cooperation on tackling antibiotic resistant bacteria has to be taken on war footing.

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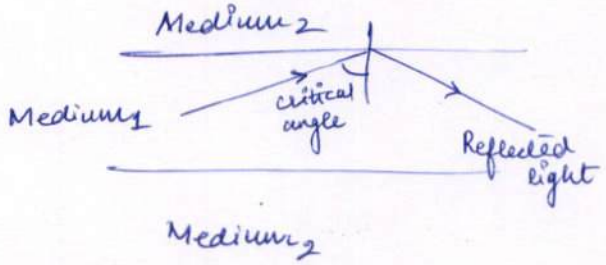
20. Explain the principle behind signal propagation in an Optical Fibre. Why is optical fibre network considered critical to meet the goals of Digital India Programme? Discuss the challenges being faced in implementation of NOFN/Bharatnet and give suggestions to overcome them.

किसी ऑप्टिकल फाइबर में संकेत के प्रसारण के सिद्धांत की व्याख्या कीजिए। डिजिटल भारत कार्यक्रम के लक्ष्यों को प्राप्त करने हेतु ऑप्टिकल फाइबर नेटवर्क को क्यों महत्वपूर्ण समझा जा रहा है? एन.ओ.एफ.एन./भारतनेट के कार्यान्वयन में सामना की जा रही चुनौतियों की चर्चा कीजिए तथा उनसे निपटने के लिए सुझाव प्रस्तुत कीजिए।

Signal in an optical fibre propogate through Total Internal Reflection concept. It transmits clear signals without energy loss. Any beam of light if travelling along a medium interface ~~now~~ gets reflected ~~of~~ beamed at a critical angle causing Total Internal Reflection.



Optical fibre network is considered to meet the goals of Digital India Programme as internet connectivity to large distances is possible by optical fibres. It can carry information

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without intermixing, interference from noise and hence builds a platform for terrestrial internet.

Challenges faced by NOFN/Bharatnet's implementation are :-

i) Delay causing cost overruns

ii) Land clearance for optical fibre network

However, the speed of the project has picked up for connecting 2.5 lakh gram Panchayats by 2019.

Some suggestions are :-

- Outsourcing the work of laying optical fibre within a limited time framework could lead to quicker connectivity.

The digital revolution can be made possible by waking 60% of the Indian population to Internet, a dream only possible by the spread of Bharatnet network.

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GENERAL STUDIES (TEST CODE : 756)

Name of Candidate	ARUSHI MISHRA		
Medium Hindi/Eng.	ENGLISH	Registration Number	15577
Center	ORN	Date	1/11/2016.

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	12.5	
2	12.5	
3	12.5	
4	12.5	
5	12.5	
6	12.5	
7	12.5	
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13	12.5	
14	12.5	
15	12.5	
16	12.5	
17	12.5	
18	12.5	
19	12.5	
20	12.5	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are TWENTY questions printed in HINDI and ENGLISH.
   इसमें बीस प्रश्न हैं तथा हिन्दी और अंग्रेजी दोनों में छपे हैं।
3. All questions are compulsory.
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

EVALUATION INDICATORS

1. Alignment Competence
2. Context Competence
3. Content Competence
4. Language Competence
5. Introduction Competence
6. Structure - Presentation Competence
7. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

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Answer all the questions in NOT MORE THAN 200 WORDS each. Content of the answers is more important than its length. All questions carry equal marks.

12.5X20=250

1. India has recently acquired the membership of MTCR, whereas it aspires to enter the NSG. In this context, what is the significance of MTCR and NSG for India? Discuss the factors that are responsible for the different outcomes of India's effort to acquire the membership of these two.

भारत ने हाल ही में एम.टी.सी.आर. (प्रक्षेपास्त्र प्रौद्योगिकी नियंत्रण व्यवस्था) की सदस्यता ग्रहण की है तथा यह एन.एस.जी. (नाभिकीय आपूर्तिकर्ता समूह) में सम्मिलित होने की महत्वाकांक्षा रखता है। इस संदर्भ में भारत के लिए एम.टी.सी.आर. और एन.एस.जी. का महत्व क्या है? भारत द्वारा इन दोनों की सदस्यता प्राप्त करने के प्रयासों के भिन्न-भिन्न परिणामों के लिए जिम्मेदार कारकों की चर्चा कीजिए।

The year 2016 witnessed India's entry to MTCR group whereas, the plenary session in Seoul of NSG for India's proposed membership didnot yield results as desired.

The significance of joining an international group dealing with defence and nuclear security like MTCR and NSG are manifold as :-

i) Entry of a non-NPT signatory member NSG heralds an ideological victory

ii) Regularisation of India's nuclear program

iii) Ease of access of nuclear fuel as NSG members have passed a resolution to restrict nuclear fuel export to non members.

iv) Permission of nuclear fuel recycling

v) India can import nuclear technology to other countries

vi) Access to technology

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vii) funding
viii) Help India to achieve its clean energy targets.

MTCR

i) Now India can build missile warhead of more than 300km range
ii) Access to new missile technologies
iii) Ease of acquiring Predator drones from the U.S.A.
iv) Can import BRAHMOS to countries like Vietnam
v) funding access.

NSG membership of India was questioned by many countries like Brazil, Ireland, New Zealand but was predominantly thwarted by China. The basis was India being a non signatory of NPT whereas, the group's requirement for membership is NPT signatory. Since the group works by consensus and not majority hence India lost its bid due to many objections.

However, MTCR is a voluntary grouping of 35 nations that do not insist of NPT's signatory or not. India joined MTCR by choice.

However, 38 out of 48 countries of NSG favouring India's entry due to its credentials mark an important turn in India's entry into the world stage as a country of impeccable track record.

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2. India's membership in SCO promises to be a win-win proposition for all the stakeholders including Central Asia, Russia and India. Comment. Can this move improve the security situation in Aghanistan?

एस.सी.ओ. (शंघाई सहयोग संगठन) में भारत की सदस्यता मध्य एशिया, रूस और भारत सहित सभी हितधारकों के लिए लाभकारी प्रस्ताव सिद्ध होने का वादा करती है। टिप्पणी कीजिए। क्या यह कदम अफगानिस्तान में सुरक्षा की स्थिति में सुधार कर सकता है?

SCO admitted India in 2016 as a full member. This elevation from the accreding state to full membership opens plethora of opportunities and potentials to be tapped.

As a military cooperation organisation in its start, it has turned to be a multilateral fora for regional problems and cooperation. It is a win-win situation for the region for the following reasons:-

i) Ensures energy cooperation
ii) Lies in the proposed 'One Belt One Road' initiative of China proposing enhanced connectivity
iii) Opportunity for trade

Central Asia is oil rich needing importers hence this grouping ensures land based oil pipelines to supply energy a competitive rates to neighbouring countries.

Russia, after sanctions from the West, is in search of market to export oil, gas, arms, etc

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to control Rouble from falling further and land based connectivity provides good option.

India benefits as a net energy importer nation. Benefits of enhanced security cooperation would also deepen the trust between India and China.

Afghanistan tends to benefit from the military cooperation through training, arms, etc so as to quell the anti-state actors and promote peaceful trade ties with the grouping. A regional grouping will help to enhance the status and the reconstruction efforts.

The predominance of China in SCO is a matter of thinking but the benefits outweigh the concerns. If managed tactfully, this grouping can lead to a lot of money to cash starved developing economies from China based AIIB, the Asia Infrastructure and Investment Bank.

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3. The Nano mission has not only established a good eco-system to pursue basic research but also nurtured application-oriented R&D, focused on useful technologies and products. Comment. Also examine the need of building a regulatory framework encompassing public safety to harness the advances made in nanotechnology.

नैनो मिशन ने न केवल आधारभूत शोध करने हेतु उपयुक्त पारितन्त्र की स्थापना की है, बल्कि उपयोगी प्रौद्योगिकियों और उत्पादों पर केंद्रित अनुप्रयोग-उन्मुख शोध एवं विकास को भी पोषित किया है। टिप्पणी कीजिए। साथ ही, नैनो प्रौद्योगिकी में हुई प्रगति का दोहन करने हेतु सार्वजनिक सुरक्षा से सुसज्जित नियामक ढांचे के निर्माण की आवश्यकता का परीक्षण भी कीजिए।

Nano Mission was started in 2007 is giving results in promoting a good research environment along with useful R and D by good ecosystem.

Nanotechnology is emerging fast as a technology of future and in this aspect India's NANO MISSION flagged back in 2007 is making considerable advancements.

Nano mission has created an environment of application - oriented R&D ~~and~~ like Quantum Dot Technology application with regard to cancer and other diseases.

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The recently created nanoparticle using filter made of 'Chitosan', an organic filter has made water purification systems cheaper and accessible to vastly poor population of India.

Creation of graphene based cells to food grade stain Tintorang, our R&D ecosystem has created wonders in bringing technology from labs to doorsteps. Enhanced funding to nanotechnology research projects and creation of incubator labs has promoted application oriented research.

There is a need to build a regulatory framework encompassing public safety as the nanotechnology field is new with revolutionary effects. Its consequences are not fully established, hence a regulatory authority overseeing the potential misuse and also promoting the field is required.

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4. World Drug Report 2016 identifies India as a transit point for drugs headed for other destinations. Examine the causes and consequences of such a state of affairs in the context of rising spectre of drug consumption in some states in India.

विश्व मादक द्रव्य रिपोर्ट, 2016 ने अन्य गंतव्य स्थानों तक पहुँचने वाले मादक द्रव्यों के ट्रांजिट पाइंट (पारगमन बिन्दु) के रूप में भारत की पहचान की है। भारत के कुछ राज्यों में मादक द्रव्यों की खपत की बढ़ती समस्या के संदर्भ में कारणों और परिणामों का परीक्षण कीजिए।

The increasing menace of the drugs has made some states as 'Mexico' of India and this has been sealed by World Drug Report 2016 that states India as a drug transit point.

The border states of Punjab and the North Eastern states are affected by increased drug consumption due to the following reasons:-

i) Porous border leading to smuggling
~~ii) Increased income and~~
ii) Unemployment in green revolution belt due to droughts, land fragmentation, decreased water level and no jobs leading to frustration
iii) Less development in North East causes alienation
iv) Some marginal cultural effects
v) Lack of political will
vi) Police and drug control agencies' laxity.

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Consequences of drug transit and consumption are:-

i) Ruining of families

ii) Irreparable loss of human lives.

iii) Billion dollar industry leading to human trafficking and bonded labour

iv) Loss of productive population to neurological diseases

v) Parallel economy hurting state's revenues

Drug consumption has been a menace and has now become a larger concern as India has become the soft state for not only transit but to make people addict and thereby causing social and economic losses. Moreover, the problem is concentrated in border areas which raises suspicion and jeopardises National Security.

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5. How is the Sagarmala project a concept in the direction of implementation of Blue revolution? Examine whether the Sagarmala project can also provide a balance to the Maritime Silk Road initiative by China.

सागरमाला परियोजना को नीली क्रान्ति के कार्यान्वयन की दिशा में एक विचार कैसे माना जा सकता है? परीक्षण कीजिए कि क्या सागरमाला परियोजना, चीन की समुद्री रेशम मार्ग पहल को सन्तुलित कर सकती है?

The concept of linking through ocean -

The Blue Revolution is pillared on the success of the Sagarmala Project which envision a port led holistic development.

The features of sagarmala Project are :-

i) Building new ports along coastline
ii) Upgrading the older ports
iii) Development of inland waterway to connect rivers to ports
iv) Establishing industrial parks along ports
v) Enhancing the Export Import Infrastructure along ports like - banking, berthing, easy clearance, etc.

It links our coastline into an integrated link of ports and provides for easy logistics and connectivity with other ports of the Indian Ocean Region, linking the 'Blue Economics'

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The maritime silk Road initiative of China is based on the 'String of Pearls' concept of connecting the various ports in the Indian Ocean Region. It is difficult to counter China through our Sagarmala Project due to less infrastructural and credit strength, however, it can provide a balance. Sagarmala Project will lead to ~~more~~ enhanced cooperation among Indian ocean economies and hence it can make its presence felt in the area being already crowded by China.

However, the Blue revolution as envisaged through Sagarmala Project of enhancing India's economy through port led development and increased trade is possible when done in synergy with the massive infrastructural architecture of China. Using to its benefit, the Sagarmala Project can explore the hitherto unexplored potential of 7,500 km long coastline of India.

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6. How is the "Human Genome Project-write" (HGP-write) different from the previous Human Genome Project? Examine the potential benefits of HGP-write for India. Also discuss the associated ethical and scientific concerns.

"मानव जीनोम परियोजना-राइट पिछली मानव जीनोम परियोजना से किस प्रकार भिन्न है? भारत के लिए एच.जी.पी.-राइट के संभावित लाभों का परीक्षण कीजिए। इससे सम्बद्ध नैतिक और वैज्ञानिक चिंताओं की चर्चा भी कीजिए।

HGP-Write, which is now proposed is different from the previous Human Genome Project which was HGP-Read. HGP read was meant to read the genome, genetic sequences to create a data. It did ~~not~~ run successfully from 1995 to 2003. However, HGP-Write intends to take it to a further level of manipulating with the genome by editing, deleting and inserting the concerned genes.

The potential benefits of HGP-write for India are:-

i) Decrease in deadly diseases caused by genetic problems like Alzhiemer's, CHARGE syndrome, etc

ii) Creation of healthy babies

iii) Producing healthy livestock

iv) Altering with virus, bacteria, mosquito, ~~etc~~ gene to render them harmless.

v) Desired quality plants

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The ethical concerns surrounding this is of the commercialisation of designer babies, tampering with natural evolution process and the prospects of potential misuse.

The scientific concern is that since the technology is new and very intrusive, its effects on future environment, human life and planet is unknown. Hence, a calculated approach is needed.

HGP-Write project though offering opportunities to enhance mans life from diseases offering better quality life, holds a concern if this tampering with natural process comes out to be destructive, this can wreck a hanoc on humanity. Hence, a step by step guarded and extremely crucial cases should be dealt with this.

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7. In recent times, instances of lone wolf terrorist attacks have been on an increase. Examine the causes and suggest how India should prepare itself to avoid such attacks.

हाल के दिनों में, लोन वुल्फ आतंकवादी हमलों की घटनाओं में वृद्धि होती रही है। इसके कारणों का परीक्षण कीजिए और यह सुझाइए कि इस प्रकार के हमलों से बचने हेतु भारत द्वारा स्वयं को किस प्रकार तैयार करना चाहिए।

The lone wolf terrorist attacks in the U.S.A. or in Peshawar or in Europe has come to acquire the forefront with new category of Do-it-yourself brand of terrorists.

The reasons for the increase are :-

i) Easy indoctrination of terrorists due to internet penetration

ii) Anger and frustration in life leading to indoctrination

iii) Very easy to hide hence this is promoted by terrorist organisations

iv) Increased alienation of minorities

v) Some nations have lax Gun laws leading to easy access of weapons to indoctrinated disgruntled minds.

The relative ease of lone wolf attacks and their quick results have lured the fundamentalist

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minds to do something for the "perceived" greater good.

To prepare itself India has taken measures like :-

i) Introduction of social Media Bill, 2016 to clamp down messages of fundamentalist, hateful nature

ii) Asked states to form curriculum to counter rise of fundamentalism in schools.

iii) Banning of suspicious preachers

iv) Intense social checking

v) Tracking of suspicious persons

vi) Revival of NATGRID for intelligence sharing

vii) Taking help from religious preachers to counter religious fundamentalism preached by nefarious preachers of the same sect.

The threat of lone wolf attack though looms ~~aroa~~ above India, however a pluralistic society has been able to subsume the negative tendencies and these measures would go a long way to preserve the peaceful ethos of the country.

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8. The present global scenario makes it imperative that the Indian Ocean and Pacific Ocean must be seen as inter-connected entities. Discuss how India can leverage its position in the Indo-Pacific region to promote its interests.

वर्तमान वैश्विक परिदृश्य हेतु यह अत्यावश्यक है कि हिन्द महासागर और प्रशान्त महासागर को अंतर-संबधित घटकों के रूप में ही देखा जाना चाहिए। भारत अपने हितों को बढ़ावा देने हेतु भारत-प्रशान्त क्षेत्र में अपनी स्थिति का लाभ किस प्रकार उठा सकता है। चर्चा कीजिए।

In the interconnected world, the two big oceans - Pacific and Indian presents unbound opportunities for cooperation.

Working in silos might not be favourable due to the expansion of interests and hence now Pacific Ocean and Indian Ocean must be seen as interconnected entities. The trade blocks like ASEAN and TPP already provide the potential for partnership. Connected through Malacca straits it provides immense opportunity for trade as it connects the developed countries (Japan, U.S.A.) to underdeveloped countries (Africa) via developing countries (South Asia).

India, sadly being not a part of either ASEAN and the Trans Pacific Partnership needs to

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flex its muscles to promote its interests in the Indo Pacific region.

India as a neutral rule bound democracy has always been pivot to any Asian rebalance. Also, its strategic location in the Indian Ocean region leverages its position. To utilise this, India can:-

i) Join RCEP (Regional Comprehensive Economic Partnership) to not to be left out

ii) Connect the Indian Ocean nations through maritime routes so as to enable easy cargo of Pacific to pass through it.

iii) Enhance strategic military exercises eg: Malabar Exercise

Hence, India has to take maximum benefit lying on the middle of the potentially biggest trade route from USA. to Africa via South Asian Nations by not only its capacity by Sagarmala Project but also by joining China's Maritime Silk Route and ~~the~~ various regional groupings.

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9. While LEDs have many advantages there are certain disadvantages and challenges in its use as well. Elaborate. Highlight the measures taken by the government to promote LEDs in India.

यद्यपि एल.ई.डी. के अनेक लाभ हो सकते हैं, तथापि इनके प्रयोग में कुछ हानियाँ और चुनौतियाँ भी हैं। विस्तार से बताइए। भारत में एल. ई. डी. को बढ़ावा देने के लिए सरकार द्वारा किए गए उपायों पर प्रकाश डालिए।

LEDs have revolutionised our energy consumption in the recent times. The most efficient technology available, it has many advantages and some disadvantages as follows:-

Advantages

i) Very less power consumption
ii) Long lasting ⇒ 8000 times the normal bulb
iii) Cheap
iv) Bright white light emitted
v) The bulb/ tube does not get hot
vi) Safer than CFLs that contains hazardous mercury

Disadvantages

i) Disruptive to sleep cycle especially the Blue LED
ii) Costly one time installation as compared to normal bulbs.

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Measures taken by the Government to promote LEDs in India are :-

i) Giving tax benefits/relaxation for to the manufacturers

ii) Assured procurement by Government at a profitable price for public distribution

iii) LED program by DELP and Bureau of Energy Efficiency to provide subsidised LED bulbs to every household to increase its penetration.

The LED bulb penetration would decrease the energy demand manifold and hence help Government reduce its import bill on energy supplies. Also the manufacturing promotion will lead to increased cost effective exports to help India earn foreign currency. Hence, a win-win opportunity needs rigorous promotion.

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10. India accounts for one of the largest HIV infected population in the world. Explain the major reasons for such high prevalance. Also examine the steps taken by the government over the years to curb the spread of HIV.

भारत में विश्व की सर्वाधिक विशाल एच.आई.वी. संक्रमित जनसंख्या पायी जाती है। इस प्रकार के उच्च प्रसार के प्रमुख कारणों की व्याख्या कीजिए। एच.आई.वी. का प्रसार रोकने के लिए सरकार द्वारा पिछले वर्षों के दौरान उठाए गए कदमों का परीक्षण भी कीजिए।

HIV infection has crippled India for long. As an autoimmune disease it renders a lot of social and economic hardships to the patients and the nation as well.

Reasons for its prevalence are :-

i) Poverty leading to ignorance

ii) Unsafe sexual intercourses due to ignorance

iii) use of infected syringes, blades in hospitals

iv) use of syringes for drug administration - a part of drug problem too.

v) Stigma attached to it leading to less disclosure and hence decreased access to drugs.

vi) Costly antiretroviral therapy.

vii) Shortage of drugs though provided free by the government.

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The steps taken by the Government for curbing HIV spread are :-

i) Tightening control of drugs by NACO, the apex authority for AIDS in India

ii) Free antiretroviral therapy to patients

iii) Collaborating with W.H.O. for awareness drive

iv) 'Mission Sunrise' in North Eastern states to curb drug use through syringes causing AIDS.

These interventions have had the positive effect with the recent W.H.O. report reporting a decline in the number of AIDS patients in India, the only country in the world to start the back trajectory in the control of the deadly disease.

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11. At a time when all major countries are deepening their ties with Africa, establishing economic and strategic relations with it poses a distinct challenge for India. Comment.

ऐसे समय में जब सभी प्रमुख देश अफ्रीका के साथ अपने संबंधों को प्रगाढ़ कर रहे हैं, इसके साथ आर्थिक और सामरिक संबंधों की स्थापना भारत के लिए एक विशिष्ट चुनौती बन गयी है। टिप्पणी कीजिए।

African continent full of resources and developmental opportunities forms the new landscape of competing investments by various countries with China and U.S.A. having established strong presence in Africa through trade pacts and investment agreements, it becomes imperative to India to expand its footprint in the African subcontinent.

When Indian economy is growing but needs investments in its own country for development, it becomes challenging for India to compete with the level of investments like of China. However, the historically good ties of India with Africa and suspicion towards interfering Chinese investments opens doors for India.

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Some challenges in establishing economic and strategic relations are:-

i) No land connectivity

ii) Sea route prone to piracy

iii) Need a lot of capital for investments

iv) Crowding by China, U.S.A., E.U., etc.

However, the 3rd India Africa Meeting restored the ~~wort~~ faith in the workability of India Africa ties as seen by

eg: – Pelindaba treaty — Namibia

– Solar Mamas —— Tanzania

India's soft power with cooperative and non intrusive investments can help building trade ties ~~and~~ providing energy security and market to India.

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12. The issue of Intellectual Property Rights (IPR) as seen in the 'Special 301' list, remains a bone of contention in otherwise burgeoining Indo-US ties. What is the significance of India being put in the Priority Watch List? Examine the merits of WTO dispute settlement mechanism over bilateral negotiations in the context of IPR issue between India and United States.

बौद्धिक संपदा अधिकार (आई.पी.आर.) के मुद्दे को 'विशेष 301' सूची में जिस प्रकार देखा गया है, वह अन्यथा निरंतर विकसित होने वाले भारत-अमेरिका संबंधों में विवाद का विषय बना हुआ है। भारत को प्राथमिकता निगरानी सूची में रखे जाने का क्या महत्व है? भारत और संयुक्त राज्य अमेरिका के बीच बौद्धिक सम्पदा अधिकार (आई.पी.आर.) की समस्या पर द्विपक्षीय संधिवार्ताओं की तुलना में डब्ल्यू.टी.ओ. के विवाद निपटान तंत्र की श्रेष्ठता का परीक्षण कीजिए।

Being put in the 'Priority watch list' of the 'Annual special 301 list' consequitively for the second time has strained the ties a bit.

The dispute between the TRIPS compliant yet contentious clauses of Section 3(D) of Indian Patents Act and Compulsory Licensing is the major bone in the issue. The recent case of Glivec and Novartis made U.S.A. go to the WTO dispute settlement mechanism.

India being put in the 'Priority watch List' leads to degradation of the status of India as a robust IPR policy nation. It invites considerable restrictions in the trade ties if India

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creates any trouble. It even permits USTR, the US's apex body dealing with IPR issues to sue India for unfavourable trade practices.

This leads to contention between both the nations as Indian rules are WTO compliant, but USA wants stricter IPR regime which is unfair to Indian social, economic issues.

The merits of WTO dispute settlement mechanism over bilateral mechanism of dispute settlement in the context of IPR issue is that it listens impartially to the arguments and promotes the international norm rather than the interests of the powerful country.

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13. NISAR is being celebrated as the biggest collaboration between NASA and ISRO. Elaborate upon the purpose, special features and future prospects of this mission.

निसार (NISAR), नासा और इसरो के बीच सबसे बड़े सहयोग के रूप माना जा रहा है। इस मिशन के उद्देश्य, विशिष्टताओं और भावी संभावनाओं के संबंध विस्तार से बताइए।

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14. Taking example of Google Street View, discuss the importance as well as challenges posed by the availability of Geospatial information. Also, analyse the important features of the Geospatial Information Bill, 2015.

गूगल स्ट्रीट व्यू का उदाहरण लेते हुए, भू-स्थानिक सूचना की उपलब्धता का महत्व एवं साथ ही साथ इसके द्वारा उत्पन्न की गयी चुनौतियों की चर्चा कीजिए। भू-स्थानिक सूचना विधेयक, 2015 की महत्वपूर्ण विशेषताओं का विश्लेषण भी कीजिए।

The recent rejection of the proposal of 'Google street view' to provide geospatial information online brings this issue at forefront. Google street view offered the maps of the places in the entire country for easy navigation and search.

The importance of availability of the Geospatial information is :-

i) Map the terrain, places for easy access
ii) Boosts connectivity
iii) Help disaster relief efforts
iv) Boosts tourism
v) Easy navigation.

The challenges are :-

i) can be misused by non state actors
ii) Mapping of strategic places can be used by terrorists eg: one in Pathankot attack
iii) Privacy issues

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The important features of the Geospatial Information Bill 2016 are;-

i) Need permission for maps - online and offline

ii) Licence from Security Vetting Authority

iii) Non mapping of strategic areas

iv) Any discription mistake to invite fines upto 100crore and jail term upto 7 years.

v) No disputed territory to be shown as part of ~~Ind~~ Pakistan and China.

Some features of this bill are a little tough than the Geospatial Regulation Policy 2015 passed to regulate as well as promote geospatial mapping that holds a powerfool tool for a plethora of market services available in the era of Information Technology.

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15. What are technology business incubators? Elaborate upon the challenges faced by startups in India. How can the Atal Innovation Mission help in promoting technology business incubators in India?

टेक्नॉलजी बिज़नेस इन्क्यूबेटर क्या हैं? भारत में स्टार्टअप्स द्वारा सामना की जाने वाली चुनौतियों पर प्रकाश डालिए। अटल नवोन्मेष मिशन भारत में टेक्नॉलजी बिज़नेस इन्क्यूबेटरों को बढ़ावा देने में किस प्रकार सहयोग कर सकता है?

Technology business incubators are a form of concentrated platform for service and help to be given by the government to facilitate business models relating to technology. It is a part of the larger research and innovation incubation drive in India.

Startups face numerous challenges owing to their small & muscle flexing capability in difficult work environment.

i) Paucity of funding and high taxes
ii) Bureaucratic red tape
iii) Difficult registration
iv) Tough closing down a business
v) Need platform for innovators and professionals meeting ground
vi) Low internet penetration
vii) Tough and costly IPR registration

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These problems were recently recognised as more than 80% of Indian startups chose to start from a different country than India. Hence, Atal Innovation Mission was introduced to promote technology business incubators which promotes startups. It provides funding, facilities for research, meetings of innovators and fundings, etc and hence it provides an ideal way to kick start the laggardly yet strong startup culture of India.

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16. The 2016 Nuclear Security Summit marks the end of a process that began in 2010 with the aim to "secure all vulnerable nuclear material around the world within four years". Although it has failed to achieve its stated goal but its failure has been nevertheless a glorious failure. Discuss.

परमाणु सुरक्षा शिखर सम्मेलन, "चार वर्ष के भीतर विश्व की सारी संवेदनशील परमाणु सामग्री को सुरक्षित करने" के उद्देश्य के साथ 2010 में आरम्भ हुई प्रक्रिया की समाप्ति को चिह्नित करता है। हालांकि यह अपने घोषित लक्ष्य को प्राप्त करने में विफल रहा, फिर भी इसने उल्लेखनीय सफलता को प्राप्त किया। चर्चा कीजिए।

Nuclear Security Summit culminated in U.S.A. in 2016 as a glorious failure, taking forward the task which was hitherto untouched since decades.

It was a restricted summit ~~dt~~ concerned with the civilian nuclear material and not military. It also didnot include Russia which hold the maximum nuclear warheads. Hence, to judge by holistic perspective it can sound like a failure but constraining judgement to the prescribed criteria turns it to be a 'Glorious failure'.

Though it did not secure all vulnerable nuclear material in four years, yet it achieved considerable success in :-

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i) Bringing more civilian facilities under IAEA - International Atomic Energy Agency

ii) Strengthening structural and physical barriers to nuclear fuels in countries

iii) Tightening of regulations of sale and upkeep.

iv) Most importantly, it helped in phasing Highly Enriched Uranium (HEU) from 13 countries.

v) Did set up a fund to promote low Enriched Uranium fuels and safe nuclear practises.

Hence, though unable to achieve its stated objective, it made a tiny step towards the right direction of atleast securing civilian nuclear material lest it falls in bad hands for distasteful purposes.

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17. India's achievements in the space sector have not only pushed our scientific frontiers but are also critical in ensuring our national security. In the above context, discuss the role of various space missions and the need to develop a space security policy.

अंतरिक्ष के क्षेत्र में भारत की उपलब्धियों ने न केवल हमारी वैज्ञानिक सीमाओं को विस्तार दिया है, बल्कि वे हमारी राष्ट्रीय सुरक्षा की सुनिश्चितता के लिए भी महत्वपूर्ण हैं। उपर्युक्त संदर्भ में, विभिन्न अंतरिक्ष मिशनों की भूमिका और अंतरिक्ष सुरक्षा नीति विकसित करने की आवश्यकता पर चर्चा कीजिए।

The launch of SCATSAT-1, 8 payloads in two different orbits by one rocket launch, makes India the ONLY country in the world to achieve this. ~~feat~~

Indian space missions everytime pushes our scientific frontiers to another level. Often, national security gets enhanced once ISRO achieves another lauel.

The launch of Chandrayaan-1 and Mangalyaan in maiden launch with frugal engineering made India stand in the league of scientifically advanced nations. This status has earned India foreign currency by launching various satellites of even advanced countries at low cost.

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The launch of NAVIC constellation for navigation services has enhanced national security by reducing dependence on GPS. The 'Restricted Service' of NAVIC will help security agencies navigate even in case of war. Also the launch of satellites like CARTOSAT, INSAT provides essential communication networks which helps to maintain link even when problems occur.

There is a need to develop a space security policy for following reasons:-

i) Vast space, mostly unregulated
ii) Future of the world lies there
iii) Potential of hacking, misuse of satellites
iv) Promotion of our ~~satellite~~ space industry
v) Prevent accumulating space debris.

Hence, a strong space security policy is needed for India to be a strong and efficient player in the $300 billion space industry.

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18. What do you mean by cloud seeding? Critically examine its utility as a substitute for bad monsoon.

क्लाउड सीडिंग से आप क्या समझते हैं? खराब मानसून के विकल्प के रूप में इसकी उपयोगिता का समालोचनात्मक परीक्षण करें।

Cloud seeding is the technology of seeding the clouds artificially by using silver iodide particles. This provides as a condensation nuclei for precipitation to occur.

Due to global warming and climate change, ~~our~~ Indian monsoon is not as strong as it used to be thereby leading to droughts.

Using cloud seeding as a substitute for bad monsoon can have following advantages and disadvantages.

Advantages

i) Can have rainfall where and when desired
ii) Easing drought pressure leading to large scale deaths, poverty and migration

Disadvantages

i) Changing the natural course of the environment
ii) This technology has soo far not given consistent results.

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The use of any technological intervention to substitute natural process can be used as an exception but should not be used as a rule. There should be focus on natural interventions like afforestation, water management etc.

Any technology cannot be an absolute substitute for a natural process especially as large as a MONSOON that covers an entire subcontinent. Hence, it can help in parts but to substitute it for monsoon is not a feasible solution.

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19. What is Li-Fi and how does it differ from Wi-fi technology? Explain the advantages, limitations and potential applications of Li-Fi technology.

लाई-फाई (Li-Fi) क्या है और यह वाई-फाई (Wi-fi) प्रौद्योगिकी से किस प्रकार भिन्न है? लाई-फाई प्रौद्योगिकी के लाभ, इसकी सीमाओं और संभावित अनुप्रयोगों की व्याख्या कीजिए।

Li-fi is the short form of Light-Fidelity which is a technology that provides internet connectivity through photons (light).

It differs from Wi-fi in the manner of its transmission via photons and the spectral efficiency of its transmission. Wi-fi uses communication bandwidth whereas Li-fi uses spectral bandwidth.

The new technology brings a host of advantages as :-

i) Very low cost
ii) Can work with even a dimly lit bulb
iii) Faster speed than wifi
iv) High efficiency
v) Can spread to every nook and corner where electricity is, therefore can provide internet connectivity in the hinterland.

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However, there are some limitations as:-

i) Can work only where light can reach
ii) No inter-room connectivity
iii) Difficult to prepare network.

Potential applications of the Li-fi technology rests with the spread of internet to the rural areas with electricity. It can revolutionise the world of which still 2/3rd remain out of internet connectivity. Still in the nascent stage, this technology provides avenues for new age internet connectivity lowering digital divide.

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20. It has been argued that India and Latin America need to enlarge and strengthen existing agreements in order to mutually gain from the potential of their partnership. Discuss with special reference to India- MERCOSUR Preferential Trade Agreement.

यह तर्क दिया जाता रहा है कि अपनी साझेदारी की क्षमता का पारस्परिक लाभ प्राप्त करने हेतु भारत और लैटिन अमेरिका को वर्तमान समझौतों को विस्तारित और सुदृढ़ करने की आवश्यकता है। भारत-मर्कोसुर प्रेफरेन्शल व्यापार समझौते के विशेष संदर्भ में इस पर चर्चा कीजिए।

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